STEP-BY-STEP SYSTEMS
NO. 1
TRANSMISSION TEST LINE CIRCUIT AND PERMANENT SIGNAL RELEASE CIRCUIT FOR CONNECTORS AND SWITCHMAN'S TALKING LINE CIRCUIT

CHANGES

C. CHANGES IN CIRCUIT REQUIREMENTS OTHER THAN THOSE APPLYING TO ADDED OR REMOVED APPARATUS

C.1 The release adjustment for relay (ST) was, readj. 0.7.

C.2 Added test note "Adjacent relays shall not be energized. See B.S.P."

C.3 Removed blocking inf. "(SO)NO" for relay (ST) on ckt. req. table.

C.4 Added insulate inf. for relay (ST) on ckt. req. table.

All other headings, No change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3350-RLQ-RSW

STEP-BY-STEP SYSTEMS
NO. 1
TRANSMISSION TEST LINE CIRCUIT AND PERMANENT SIGNAL RELEASE CIRCUIT FOR CONNECTORS AND SWITCHMAN'S TALKING LINE CIRCUIT

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 "T" and "R" leads of Fig. 1 are added, designated "to message ticketer trunk test circuit".

4. CONNECTING CIRCUITS

When this circuit is listed on a key sheet, the Connecting Information thereon is to be followed.

4.1 Test Line to 12C Test Desk SD-31400-01.

4.2 Test Distributor Control Circuit SD-31401-01.

4.3 Permanent Signal Test Circuit SD-31402-01.

4.4 Test Line Circuit for One Way Transmission Testing SD-96000-01.

4.5 Key and Lamp Circuit in No. 14 Local Test Desk SD-90050-01.

4.6 Connector Test Line SD-31653-01.

4.7 Message Ticketer Trunk Test Circuit SD-31944-01.

4.8 Local Subscriber Line Circuit in Dial Office.

All other headings, No change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3350-RLQ-RSW

CIRCUIT DESCRIPTION
SYSTEMS DEVELOPMENT DEPARTMENT

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STEP-BY-STEP SYSTEMS
NO. 1
TRANSMISSION TEST LINE CIRCUIT AND PERMANENT SIGNAL RELEASE CIRCUIT FOR CONNECTORS AND SWITCHMANS TALKING LINE CIRCUIT

CHANGES

B. CHANGES IN APPARATUS

B.1 Added

684C Sub-Set eq. with 5A Varistor
238 Type Jack Fig. 12
467A Jack Figs. 2, 5, and 10
296 and 215 Type Jacks Fig. 7

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Jacks were added as described in "B" above.

D.2 Fig. 12 was added with reference thereto in notes 102, 103 and 105 and Fig. 13 was added.

D.3 The word "loop" was added in note 103.

D.4 Note 102 was completly rewritten to provide for use of this circuit in connection with line load control and trunk group usage arrangements.

D.5 Note 105 was added.

D.6 The title of Fig. 7 was "Talking Station Jacks at Traffic or M.R. Racks of I.D.F."

D.7 In Cross Connection Fig. 53, Connecting information for the top "T" and "R" leads was "To Fig. 53" and in the title of Fig. 52, reference to Fig. 12 was added.

All other headings, no change.

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DEPT. 3350-OCH-RSW

CIRCUIT DESCRIPTION
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STEP-BY-STEP SYSTEMS
NO. 1
TRANSMISSION TEST LINE CIRCUIT AND PERMANENT SIGNAL RELEASE CIRCUIT FOR CONNECTORS AND SWITCHMAN'S TALKING LINE CIRCUIT

new

1. PURPOSE OF CIRCUIT

1.1 This circuit provides for (a) intercommunicating between maintenance men in the switch room, (b) for clearing permanent signals due to the calling party holding the connector and (c) for one-way transmission tests of connectors.

2. WORKING LIMITS

2.1 Maximum conductor loop resistance from the most remote jack at the connector frame to relay (PS) of Fig. 4 - 3.2 ohms.

3. FUNCTIONS

3.1 To provide a talking circuit for use between switch frames, message register racks and traffic register racks.

3.2 To provide for clearing permanent signals due to the calling party holding the connector.

3.3 To provide for one-way transmission tests of connectors in conjunction with transmission testing circuit.

3.4 To provide a talking circuit from AB toll transmission selector, toll transmission selector and coin control selector frames by use of a subscriber line circuit in the dial office.

4. CONNECTING CIRCUITS

4.1 Test line to 12C test desk.

4.2 Test distributor control circuit.

4.3 Permanent signal test circuit.

4.4 Test line circuit for one-way transmission testing.

4.5 Key and lamp circuit in No. 14 local test desk.

4.6 Connector test line.

4.7 Local subscriber line circuit in dial office.

DESCRIPTION OF OPERATION

5. TALKING LINE

5.1 The talking line is used by prearrangement when two testers at different locations cooperate on a test. No signaling features are provided. Fig. 1 supplies talking battery to all talking stations and provides for connection to the No. 14 local test desk when required. Fig. 2 provides talking station jacks at switch frames, and, when permanent signal release and transmission testing is not required, at connector frames. Fig. 6 provides an induction coil and condenser circuit similar to that of a local subscriber station to operate with the talking station jacks per Fig. 7 located at traffic or message register racks or the IDF. A hand test set per Fig. 9 is used with the talking jacks of Fig. 2 and Fig. 5 and an operators set is used with the talking jacks of Fig. 7. A varistor is provided in Fig. 6 to reduce the intensity of acoustic shocks. When the operator set is plugged into the jacks of Fig. 7 the circuit to the induction coil of Fig. 6 is closed.

6. TRANSMISSION TESTING

6.1 The key in Fig. 3 is operated to its (TRANS) position when transmission tests are to be made on connectors in a hundred group other than that in which the transmission test line is terminated. The jack of Fig. 5 is patched to jacks 3 and 4 in the connector frame on which the "99" test line of each connector group is terminated. This connects 1 milliwatt testing power to the "99" terminal and transmission tests may then be made by dialing this terminal from the transmission test circuit.

7. RELEASE OF CONNECTORS HELD BY THE CALLING PARTY

7.1 When connectors are held by the calling party if the subscriber loop is not too low in resistance the connectors may be released by operating the key of Fig. 3 to the (PS RLS) position and then patching the jack of Fig. 5 to the test jack of the connector using the low resistance cord of Fig. 8. This will result in connecting the permanent signal release circuit to the connector. This latter circuit will test the subscriber line for polarity and low resistance, and if conditions are favorable will apply battery and ground to shunt down the (A) relay of the connector releasing the same.

7.2 The detailed circuit operation is as follows. As the connector will test busy there will be ground on the sleeve which will be connected to the sleeve of the jack in Fig. 5 operating relay (ST). If the permanent signal test circuit is not busy ground will be standing on lead "G" which on the operation of relay (ST) will cause relay (SO)

to operate and lock to the sleeve of the connector through the back contact of relay (EC). The operation of relay (SO) will cause the release of relay (ST). Ground from lead "G" will then, if no other (CH) relays in the test distributor control circuit or the test line circuit to the test distributor are operated, cause the operation of relay (CH) which will lock up to relay (EC). The operation of relay (CH) will operate relay (PS) disconnecting the jack of Fig. 5 from Fig. 3 and connecting it to the permanent signal test circuit, and also connecting grounds to leads "ST" and "BC". This will cause the permanent signal test circuit to begin functioning, first removing ground from lead "G" then testing the subscriber line for polarity and resistance, and if the resistance is sufficient to insure against blowing fuses (approximately 50 ohms) to apply battery and ground which will shunt down the (A) relay of the connector. This will remove ground from the sleeve releasing relay (SO). The release of relay (SO) will remove ground from lead "BC" giving an indication to the permanent signal test circuit that the connector has been released. The latter circuit will then connect ground to lead "EC", operating relay (EC) and restoring the circuit to normal. If the connector is not released due to the fact that the test circuit found the resistance of the loop too low to apply the shunting battery and ground then the test circuit will complete its cycle connecting ground to lead "EC". This will operate relay (EC) which will lock to the sleeve of the connector and will release relay (CH) and in turn (PS). The object of slow release relay (ST) and slow operate characteristics of relays (SO), (CH) and (PS) is to guard against plug fumbling when patching the jack of Fig. 5 to the test jack of the connector. In order that proper tests of the subscriber line may be made it is necessary that the tip and ring leads of the patching circuit be completed by the time relay (PS) operates.

7.3 As the test man is observing the action of the connector no signal is necessary to indicate whether or not the connector releases. If the connector does not release after an interval of approximately 10 seconds following the completion of the patch it is an indication either that the subscribers loop is too low in resistance, that the permanent signal test circuit is busy, or that there is trouble in the circuit.

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